

Attorney Docket No.: C70361  
U.S. Serial No. 09/762,022  
Group Art Unit: 1744

**REMARKS**

This Amendment is made in response to the Official Action mailed May 1, 2003. A request for a three-month extension of time accompanies this Amendment. In addition, new drawings are included which address the objections made by the Examiner. Ten (10) Replacement Sheets depicting the new drawings are enclosed. Claims 1, 2, 4, 5, 7-11, and 14-17 have been amended. Claims 3, 6, 12 and 13 have been cancelled. Accordingly, claims 1, 2, 4, 5, 7-11, and 14-17 remain pending in this application. Reconsideration and withdrawal of the objections to and rejections of this application are respectfully requested in view of the above amendments, and further, in view of the following remarks.

Preliminarily, Applicant notes that the specification has been amended to insert headings where appropriate. In addition, the specification has been amended in accordance with the Examiner's helpful suggestions. Regarding the term "ca." used at page 20, line 15, Applicant submits that this is a well-known abbreviation for "about". In this context, the term is meant to mean that the angle referred to is about 45 degrees. Applicant submits that the amendments to the specification have effectively addressed the Examiner's objections. Further, the title of the application has been amended to be more descriptive.

Claims 3 and 5 have been objected to. Claim 3 has been cancelled, and claim 5 has been amended, making the objection moot.

Claims 1-17 have been rejected under 35 U.S.C. §112, second paragraph, for various allegations of indefiniteness. The specific rejections have been dealt with by appropriate amendments complying with the Examiner's suggestions. In particular it is convenient, without adding matter, to refer to the respective materials of the core and sheath as "first" and "second" plastic materials.

Further, Applicant addresses various questions posed by the Examiner with the following specific comments: claim 1, lines 7-8; Yes, the device is capable of both directing and collecting light; claim 1, line 15; Internal reflection within the core surrounded by a sheath, both core and sheath being transparent, is a well known physical phenomenon and results from the claimed differences in refractive indexes  $N^1$  and  $N^2$ . When light travelling in a transparent medium of refractive index  $N^1$  meets an interface with a transparent medium of refractive index

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$N^2$  internal reflection can occur. For example, from an underwater viewpoint the surface interface between the water and the air, both being transparent but differing in refractive indexes, is reflective; and claim 5; Yes, light can travel through the head.

Claims 1, 2, 6, 8, 11-13 and 15-16 have been rejected under 35 U.S.C. §102(a,e), as being anticipated by U.S. Patent No. 5,894,620, granted April 20, 1999, to Polaert et al. ("Polaert"). Reconsideration and withdrawal of the rejection are respectfully requested.

Claim 1 has been amended in order to clarify that the transparent material is a plastic material, as well as specifying "first and second plastic materials". Applicant submits that the amendment to claim 1 renders moot the rejection under Sections 102(a,e), and also clarifies the dependent claims. Withdrawal of the rejection is requested.

Claims 3 and 4 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Polaert in view of U.S. Patent No. 5,030,090, granted July 9, 1991, to Maeda et al. ("Maeda"). Favorable reconsideration of this rejection is respectfully requested.

As noted above, claim 1 has been amended to clarify that the transparent material is a plastic material, as well as specifying "first and second plastic materials". Further, Polaert uses optical fibers 4 to guide radiation from a source to the bristle cluster 12 (see, col. 5, line 18). The only teaching in Polaert about these fibers is their diameter and that they may be made of polymethylmethacrylate (col. 5, lines 15-18). In Maeda, fibers 1 are used which are coated with a surrounding metal layer (col. 2, lines 43-46) to cause light continually to be reflected inside the fiber.

In contrast, the present toothbrush head as claimed uses the phenomenon of internal reflection as explained above. When light travels in the transparent medium of the core of refractive index  $N^1$  meets the interface with a transparent medium of the surrounding sheath of refractive index  $N^2$  internal reflection occurs so that the light is contained within the core. There is no suggestion in Polaert of any optical interaction between the fibers 4 and the head ("thin part") 33 or any suggestion how the part 33 is constructed, e.g., whether it is hollow, solid, transparent, opaque, shiny metal or whatever. Therefore, Polaert does not disclose or suggest the claimed construction in which the core is surrounded by the transparent sheath to cause internal reflection.

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Further, Maeda does not cure the failure of Polaert. The advantage of this invention is that the reflective metal layer can be omitted and reflection can be caused simply by the interface between the two transparent plastic materials of different refractive indexes. This claimed construction avoids the cost of metal, the need for a coating operation and the possibility that the thin metal layer will become damaged to allow light to escape. These advantages are neither taught nor suggested by any fair combination of Polaert and Maeda. One of skill in the art would therefore, not have been motivated to combine the teaching of Polaert and Maeda to obtain the instantly claimed invention. Therefore, the claims are not rendered obvious.

Claims 5, 14 and 17 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Polaert in view of U.S. Patent No. 6,029,304, granted February 29, 2000, to Hulke et al. ("Hulke"). Reconsideration and withdrawal of this rejection are respectfully requested.

Hulke discloses a toothbrush head made of a transparent or translucent material, coated with either an *opaque layer* (see, col. 2, line 67) or preferably a *reflective layer such as shiny metal* (see, col. 3, line 12). Reflection occurring at an interface between transparent materials as a result of their differences in refractive index is not disclosed. Further, claims 5, 14 and 17 which are dependent upon amended claim 1, urged above to be nonobvious, should also be nonobvious. Favorable reconsideration of the rejection is requested.

Claims 7, 9 and 10 have been rejected under 35 U.S.C. §103(a) as obvious over Polaert. Reconsideration and withdrawal of this rejection are respectfully requested.

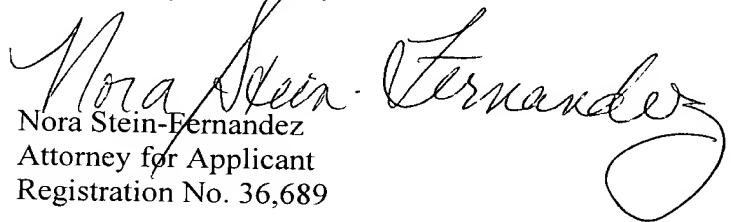
Polaert discloses that optical fibers are made of PMMA. Claim 7 requires a "second plastic material" i.e., the sheath, which is polyethyleneterephthalate (PET). There is no teaching or suggestion in Polaert of any other material for the fibers or of any surrounding material for the fibers, or of any means of causing internal reflection within the fibers. To the extent that the art cited by the Examiner refers to coatings these are opaque or reflective, rather than the present claimed transparent, with certainly no suggestion of a specific PET "second plastic material" sheath. Therefore, Polaert would not be understood by the skilled artisan to cover the instantly claimed toothbrush head construction.

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Based upon the foregoing, Applicant submits that the claims are in condition for allowance. Favorable reconsideration and withdrawal of the rejections under Sections 102 and 103 are respectfully requested.

In view of the foregoing, favorable reconsideration of claims 1, 2, 4, 5, 7-11, and 14- 17, and allowance of this application are earnestly solicited.

Respectfully submitted,

  
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